

REMARKS

Restriction Requirement

The Office previously issued a restriction requirement between three groups of claims in an Office communication mailed February 23, 2007.

Applicants responded to the restriction requirement by a Letter to the Patent and Trademark Office filed March 21, 2007. Applicants elected to prosecute claims 1-17 with traverse. Specifically applicants submitted that the claims of Groups I-III were not distinct in that the processes defined by the claims were not mutually exclusive, overlapped in some respects and were capable of use together.

The present Office action does not indicate whether the restriction requirement has been made final and does not respond to applicants' arguments as outlined in MPEP § 821.01. Applicants respectfully request withdrawal of the restriction requirement or explanation of how applicants' arguments fail to traverse the requirement and, if the Examiner is of such opinion, that the restriction be made final to preserve applicants' right to petition the director for reconsideration of the restriction requirement.

Prior Rejection Under 35 U.S.C. § 103(a)

Applicants note for the record that the current Office action does not maintain the prior rejection of original claims 1-33 under 35 U.S.C. § 103(a) as being unpatentable over the combined teachings of WO 01/08492 (Massmann et al.), U.S. Patent No. 5,070,197 (Chin et al.) and U.S. Patent No. 5,614,468 (Kramer et al.). Accordingly, this rejection has been withdrawn.

Prior Obviousness-Type Double Patenting Rejection

Applicants note for the record that the current Office action does not maintain the prior rejection of original claims 1-33 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-44 of U.S. Patent No. 6,605,568 (Massmann et al.) or claims 1-127 of U.S. Patent No. 6,734,142 (Massmann et al.), further in view of U.S. Patent No. 5,070,197 (Chin, et al.). Accordingly, this rejection has also been withdrawn.

Rejection Under 35 U.S.C. § 103(a)

Applicants respectfully request reconsideration of the rejection of claims 1-17 under 35 U.S.C. § 103(a) as being unpatentable over the combined teachings of U.S. Patent No. 6,605,568 (Massmann et al.), U.S. Patent No. 5,070,197 (Chin et al.) and U.S. Patent No. 4,405,531 (Franz).

Applicants have previously discussed and characterized the invention as defined in original independent claim 1 and the disclosures of Massmann et al. (specifically that of WO 01/08492 which corresponds to U.S. Patent No. 6,605,568) and Chin et al. in their Letters to the Patent and Trademark Office filed December 21, 2005, July 14, 2006 and December 6, 2006. Applicants submit that the pending claims remain patentable over the cited references for the reasons set forth in the above-mentioned responses. However in light of the change in Examiners, applicants will again characterize the pending claims and prior art.

Claim 1 is directed to a process for preparing a sodium glyphosate composition comprising mixing in a reactor particulate glyphosate acid, sodium hydroxide, water and optionally adjuvant to form a reaction mass wherein the total

amount of water added to the reaction mass is from about 10% to about 40% by weight of all of the particulate glyphosate acid, sodium hydroxide, water and any adjuvant added to the reactor. The glyphosate acid and sodium hydroxide react exothermically, generating heat and causing partial evaporation of the water and forming a sodium glyphosate paste having a moisture content of about from 2% to about 20% by weight.

The claimed invention produces a downstream processable sodium glyphosate paste composition of the requisite moisture content by reacting particulate glyphosate acid and sodium hydroxide in a reaction mass wherein the total amount of water added to the reaction mass is from about 10% to about 40% by weight of all of the particulate glyphosate acid, sodium hydroxide, water and any adjuvant added to the reactor. Reacting glyphosate acid and sodium hydroxide in a reaction mass in this manner allows the reaction mixture to be more readily homogenized, enabling the reaction to proceed more smoothly and completely, with greater ease of temperature control as compared to conventional solid-state reaction systems and ensures sufficient moisture remains after evaporative cooling of the reaction mass to form a downstream processable sodium glyphosate paste of the desired consistency. Surprisingly, the sodium glyphosate paste produced in accordance with the claimed process has been found to have the required absorbency and/or adsorbency properties to enable efficient formulation as a dry granular herbicidal composition by: adding adjuvant to the downstream processable sodium glyphosate paste to form an extrudable sodium glyphosate mixture; extruding the extrudable sodium glyphosate mixture to form moist coherent granules; and drying the granules. Thus, the present invention combines rapidity, completeness and uniformity of reaction to produce a sodium

glyphosate product exhibiting desirable qualities suited for downstream processing and formulation.

U.S. Patent No. 6,605,568 in the name of Massmann et al. ("the '568 patent") issued on August 12, 2003. The application that issued as the '568 patent was filed July 27, 2000 and claims priority to U.S. Provisional Patent Application Serial No. 60/146,243, filed July 28, 1999. The present application was filed on August 29, 2003 and claims priority to U.S. Provisional Patent Application Serial No. 60/407,378, filed August 31, 2002. As the '568 patent did not issue more than one-year before the filing of the present application, it is potentially prior art only under the provisions of 35 U.S.C. §§ 102(a) or 102(e). Further, for each claim of the present application that is supported by the disclosure in the priority provisional application, the '568 patent is potentially prior art only under the provisions of 35 U.S.C. §§ 102(e) and, because the present application and the '568 patent are commonly owned, would be prior art for purposes of novelty only under the provisions of 35 U.S.C. §§ 103(c). However, as previously pointed out by applicants, the international application corresponding to the '568 patent, PCT/US00/20485, published as PCT Publication No. WO 01/08492 on August 2, 2001 and is prior art under 35 U.S.C. § 102(b). Accordingly, applicants will address the new obviousness rejection raised in the current Office action assuming the Examiner intended to rely on the disclosure in WO 01/08492 rather than the '568 patent as the primary reference.

The PCT Publication of Massmann et al., WO 01/08492, is referenced at paragraph [0015] of the subject application and describes a process for forming an ammonium glyphosate paste by mixing glyphosate acid, ammonia in an amount of about 0.8 to

about 1.25 moles of ammonia per mole of glyphosate acid, and water in an amount of about 10% to about 25% by weight of all materials mixed, thereby causing a reaction of the glyphosate acid and ammonia that generates heat causing partial evaporation of the water and forms the ammonium glyphosate paste having a moisture content of about 5% to about 20% by weight. The paste can optionally be extruded to form dried granules. In particular, Massmann et al. note the surprising ability of the ammonium glyphosate paste to serve as an intermediate in the preparation of dry granular herbicidal compositions due to the superior surfactant absorbency and/or adsorbency properties exhibited by the paste without the restrictions imposed by solid-state reaction processes (WO 01/08492, page 14, lines 5-18) such as the process described by Chin et al. (referenced by Massmann et al. at page 4, lines 11-16).

Chin et al. disclose a continuous extrusion process in which a pesticidal Bronsted acid is admixed with a Bronsted base and reacted in an extruder. Glyphosate acid is mentioned among over four dozen other pesticidal Bronsted acids. The most preferred Bronsted bases include NaOH, KOH, $(C_2H_5)_2NH$, $(C_2H_5)_3N$, $(HOC_2H_4)_2NH$ or $(HOC_2H_4)_3N$. The so-called "dry reactive method" disclosed by Chin et al. is performed essentially without the addition of any extraneous solvent (e.g., water) and under conditions where the water of reaction volatilizes and is driven off by the resultant heat of reaction so that a solid end product of dry water-soluble or water-dispersible pesticide can be formed in a single step (See, for example, col. 1, lines 52-62; col. 2, lines 14-17; and col. 4, lines 51-53). Thus, in contrast to applicants' claimed process requiring the production of a sodium glyphosate paste, the process of Chin et al. is conducted in a manner to produce a solid product essentially

free of moisture and having a residual water content preferably not in excess of 5% by weight or less (See col. 4, lines 39-42).

Franz is directed to glyphosate derivatives and the activity of glyphosate and its derivatives as a herbicide. The reference discloses lab scale production of glyphosate salts including the monopotassium (Example 3) and mono-dimethylamine (Example 4) salts of glyphosate. The salts are obtained by the liquid-phase neutralization of glyphosate acid with the appropriate base followed by crystallization of the glyphosate salt by concentration of the neutralization solution.

On page 2 of the Office action the Office contends that one with ordinary skill in the art would replace the ammonia reactant of the process of Massmann et al. with bases taught by Franz in order to make other salts of glyphosate acid by a solid reaction process. However, although the sodium salt of glyphosate is included by Franz in the disclosure of numerous N-(phosphonomethyl)glycine derivatives, the reference does not teach the use of sodium hydroxide as a suitable base. Example 3 is directed to the liquid phase neutralization of glyphosate with a potassium carbonate base. Franz teaches that the corresponding ammonium salts, other alkali metal salts, alkaline earth metal salts as well as copper, zinc, manganese and nickel salts of glyphosate can be prepared in substantially the same manner (col. 6, lines 23-26), but does not make specific reference to neutralization of glyphosate acid with sodium hydroxide base to form a sodium glyphosate composition.

The Office contends that Franz discloses the use of sodium hydroxide as a base in Example 1. However, Example 1 is directed to the much different process of producing glyphosate acid by phosphonomethylating glycine with chloromethylphosphonic in a caustic reaction solution followed by acidifying the

reaction mixture with concentrated hydrochloric acid rather than neutralization of glyphosate acid with sodium hydroxide base to form a sodium glyphosate composition.

In any event, the feasibility or desirability of substituting sodium hydroxide for ammonia in the markedly different process of Massmann et al. for forming an ammonium glyphosate paste is not apparent from the teaching in the disclosure of Franz. The proper amount of water addition necessary for formation of a glyphosate salt paste will vary depending upon, among other things, the base utilized in the process, and Massmann et al. do not teach how much water is to be added to the reaction mixture to form a glyphosate salt paste other than when reacting ammonia and glyphosate acid. Moreover, the substitution proposed by the Office is in fact contrary to the teachings of the cited art. To the extent Massmann et al. suggest anything regarding sodium glyphosate compositions, the reference teaches that such compositions are disfavored as compared to ammonium glyphosate when preparing dry glyphosate formulations due to the hygroscopic nature of sodium glyphosate and its tendency to reabsorb water, resulting in a loss of free-flowing properties (See page 3, lines 12-23 of Massmann et al.). Thus, Massmann et al. discourage one from substituting sodium hydroxide into their disclosed process.

The deficiencies of Massmann et al. and Franz cannot be overcome by resort to Chin et al. While sodium hydroxide is listed among the most preferred Bronsted bases for use in the so-called "dry-reactive method" of Chin et al. (performed essentially without the addition of any extraneous solvent (e.g., water) and under conditions where the water of reaction volatilizes and is driven off by the resultant heat of reaction so that a solid end product can be formed in a single step),

that preference does not teach the feasibility or desirability of substituting sodium hydroxide for ammonia in the process of Massmann et al. directed to the production of an ammonium glyphosate paste.

As further support of the obviousness rejection, the Office asserts on page 3 of the Office action that it would have been obvious to combine a base component with glyphosate particulate acid since the prior art teaches that this solid-state reaction process is known in the art for making glyphosate salts from glyphosate acid and basic compounds.

As is clear from the cited art, applicants do not contend that solid-state processes of reacting glyphosate acid with a base component to make glyphosate salt compositions, including sodium glyphosate compositions, were previously unknown. However, applicants maintain that the process defined in independent claim 1 including mixing glyphosate acid and sodium hydroxide in a reactor and adding water to the reaction mass (including the water produced by the reaction of the glyphosate acid and sodium hydroxide) in an amount of from about 10% to about 40% by weight of all materials added to the reactor and using the heat of reaction to partially evaporate the water and form a sodium glyphosate paste having a moisture content of from about 2% to about 20% by weight is patentable over the prior art. Although Massmann et al. describes a process for the preparation of an ammonium glyphosate composition in the form of a paste suitable for downstream processing to prepare a dry granular ammonium glyphosate composition, the reference does not teach or suggest the suitability of the disclosed process for producing a paste of a glyphosate salt other than ammonium glyphosate, and in fact discourages one skilled in the art from

using the disclosed process to produce a sodium glyphosate composition.

For the reasons stated above, independent claim 1 and claims dependent therefrom are respectfully submitted as patentable over the teachings of Massmann et al., Franz and Chin et al.

Obviousness-Type Double Patenting Rejection

Claims 1-17 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-99 of U.S. Patent No. 7,141,532 issued to Graham et al. in view of *Effects on glyphosate performance of formulation, additives and mixing with other herbicides*, pp. 229-230, Chapter 15 of *The Herbicide Glyphosate*, authored by Turner. In response to the rejection applicants submit herewith a Terminal Disclaimer in compliance with 37 CFR 1.321(c). U.S. Patent No. 7,141,532 is assigned to Monsanto Technology LLC, the assignee of the subject application. Applicants respectfully request allowance of pending claims 1-17.

Applicants authorize the Office to charge the fee for a one month extension of time to Deposit Account No. 19-1345. Applicants authorize the Office to charge any fee deficiency or credit any overpayment in connection with this response to Deposit Account No. 19-1345.

Respectfully submitted,

/Michael J. Vander Molen/
Michael J. Vander Molen, Reg. No. 57,274
SENNIGER POWERS
One Metropolitan Square, 16th Floor
St. Louis, Missouri 63102
(314) 231-5400

MJV/VMK/clp